

CLAIMS

1. A drug eluting brachytherapy device, comprising:

an insertion member having a proximal portion, a distal portion, and at least one lumen extending therethrough;

5 an expandable surface member mated to the distal portion of the insertion member and defining a spatial volume therein; and

a treatment agent releasably mated with the expandable surface member;

wherein at least a portion of the treatment agent is delivered to adjacent tissue when the brachytherapy device is positioned within a tissue cavity.

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2. The device of claim 1, wherein the expandable surface member is a fluid retaining expandable surface member.

3. The device of claim 1, wherein the treatment agent is nonradioactive.

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4. The device of claim 1, wherein a radiation source is disposed inside the spatial volume.

5. The device of claim 4, wherein the radiation source generates a three-dimensional isodose profile that is substantially similar in shape to the expandable surface member.

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6. The device of claim 1, wherein the treatment agent is disposed on the outer surface of the expandable surface member.

7. The device of claim 1, wherein the treatment agent is coated on the outer surface of the expandable surface member.

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8. The device of claim 7, wherein more than one layer of treatment agent is disposed on the surface of the expandable surface member.

9. The device of claim 8, wherein different treatment agents are disposed in different layers.

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10. The device of claim 1, wherein the treatment agent is dispersed within a sidewall of the expandable surface member.

10 11. The device of claim 1, wherein the treatment agent is disposed on only a portion of the surface of the expandable surface member.

12. The device of claim 11, wherein the treatment agent is disposed on less than about half the surface of the expandable surface member.

15 13. The device of claim 1, wherein the expandable surface member includes a first surface adapted for positioning against a tissue surface.

14. The device of claim 13, wherein the treatment agent is disposed only on the first surface.

20 15. The device of claim 1, wherein the treatment agent is selected from the group consisting of, a chemotherapy drug, an anti-neoplastic agent, an anti-angiogenesis agent, an immunomodulator, a hormonal agent, an immunotherapeutic agent, a pain reliever, an antibiotic or combinations thereof.

25 16. The device of claim 1, wherein the treatment agent is mixed with a binding agent.

17. The device of claim 16, wherein the binding agent is a bioresorbable polymeric binding agent.

18. A drug eluting tissue positioning device for positioning target tissue surrounding a resected tissue cavity so that the target tissue can receive a measured radiation dose, comprising:

a catheter body member having a proximal portion and a distal portion;

an expandable surface member, the expandable surface member defining a spatial  
5 volume; and

a treatment agent releasably mated with the outer surface of the expandable surface member;

wherein at least a portion of the treatment agent is delivered to tissue surrounding the resected tissue cavity when the device is positioned within the resected tissue cavity.

19. The device of claim 18, wherein the expandable surface member is constructed of a material permeable to a treatment agent.

20. The device of claim 19, wherein a second treatment agent capable of permeating through  
15 the walls of the expandable surface member is disposed within the expandable surface member.

21. The device of claim 20, wherein a fluid delivery path for the delivery of a second treatment agent extends through the catheter body member into the spatial volume within the expandable surface member, and out through the permeable expandable surface member.

22. The device of claim 18, wherein the expandable surface member includes permeable and nonpermeable portions, and the treatment agent is mated with only the nonpermeable portions.

23. The device of claim 18, wherein the treatment agent is selected from the group consisting  
25 of, a chemotherapy drug, an anti-neoplastic agent, an anti-angiogenesis agent, an immunomodulator, a hormonal agent, an immunotherapeutic agent, an antibiotic or combinations thereof.

24. The device of claim 18, wherein a radiation source is disposed within the expandable surface member.

25. The device of claim 18, wherein an external radiation source is disposed outside of the expandable surface member.

26. A method of delivering a treatment material, comprising:

providing a drug eluting brachytherapy device having a catheter body member with a proximal portion and a distal portion, an expandable surface member defining a spatial volume, and a treatment agent releasably mated with the expandable surface member;

positioning the brachytherapy device within a tissue cavity; and

delivering the treatment agent to tissue surrounding the tissue cavity.

27. The method of claim 26, wherein the tissue cavity is a resected tissue cavity created during a lumpectomy procedure.

28. The method of claim 26, wherein the treatment material is a chemotherapy drug.

29. The method of claim 26, more than one treatment agent is disposed on the expandable surface member.

30. The method of claim 29, wherein a first treatment agent disposed in an outer layer begins releasing before a second treatment agent disposed in an inner layer begins releasing.

31. The method of claim 26, wherein the tissue cavity is a naturally occurring cavity.

32. The method of claim 31, wherein the cavity is selected from the group consisting of the bladder, the esophagus, the gut, the urethra, and the ureters.

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33. The method of claim 26, wherein the tissue cavity is mechanically formed.